

REMARKS

Status of the Claims

Claims 1, 2, 4, 6, 7, 9 and 11-16 are currently pending in the application. Claims 1, 2, 4, 6, 7 and 9-16 stand rejected. Claims 1, 6 and 13 have been amended as set forth herein. All amendments are made without prejudice or disclaimer. No new matter has been added by way of the present amendments. Specifically, the amendments to claims 1, 6 and 13 add the phrase "the polyamine compound contains 3,3'-diethyl-5,5'-dimethyl-4,4'-diaminodiphenylmethane" which is supported by the specification at page 7, lines 22-24 and Examples following page 7. Reconsideration is respectfully requested.

Rejections Under 35 U.S.C. § 103(a)

Claims 1, 2, 4, 6, 7 and 9-16 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Herbert et al. U.S. Patent No. 6,132,324 (hereinafter, "Herbert et al."), in view of Wu, U.S. Patent No. 5,908,358 (hereinafter "Wu '358") and further in view of Wu et al., U.S. Patent No. 6,210,294 (hereinafter "Wu '294"). (See, Office Action of April 20, 2006, at page 2, hereinafter "Office Action"). Claim 10 was previously cancelled without prejudice or disclaimer in the amendment of February 6, 2006. Applicant traverses the rejection as to claims 1, 2, 4, 6, 7, 9 and 11-16 as hereinafter set forth.

The Examiner states that Herbert et al. disclose a golf ball having a cover comprising a thermoset urethane cover having a thickness of less than about 0.05 inches, or 1.27 mm, and a Shore D hardness of about 30 to 60. (*Id.*). The Examiner also states that Wu '358 discloses a thermosetting urethane golf ball cover wherein the thermosetting urethane resin composition

comprises an isocyanate group-terminated urethane prepolymer and a polyamine compound covering a core having a Young's modulus of from about 5000 to 100000 psi. (*Id.*). As to Wu '294, the Examiner states that this reference discloses that "the types of polyurethane that may be used are of thermoplastic and thermoset type in which examples of how those types are made." (*Id.* at pages 2-3). Thus, the Examiner states that it would be obvious to one of ordinary skill to modify the disclosure of Herbert et al. to incorporate the polyurethane of Wu '358 "to improve shear resistance" and further modify the disclosure of Herbert et al. to incorporate the compounds of Wu '294. (*Id.* at page 3).

Claim 1 is amended to specify that the polyamine compound of claim 1 contains 3,3'-diethyl-5,5'-dimethyl-4,4'-diaminodiphenylmethane. Thus, the presently claimed invention is directed to a golf ball comprising a cover, wherein

- (a) the cover is made from a cover material including a cured product of a thermosetting resin composition containing a thermosetting urethane resin composition;
- (b) the thermosetting urethane resin composition comprises an isocyanate group-terminated urethane prepolymer and a polyamine compound;
- (c) the isocyanate group-terminated urethane prepolymer contains an isocyanate component formed by at least one diisocyanate compound selected from the group consisting of 4,4'-dicyclohexylmethane diisocyanate, cyclohexane diisocyanate and isophorone diisocyanate;
- (d) the polyamine compound contains 3,3'-diethyl-5,5'-dimethyl-4,4'-diaminodiphenylmethane;

- (e) the stiffness modulus of the cover material is 80 to 260 MPa; and
- (f) the stiffness modulus and shore D hardness of the cover material satisfy the following equation: $2.0 \leq A/B \leq 5.0$, $40 \leq B \leq 60$, A: Stiffness modulus (MPa), B: Shore D hardness.

Claims 6 and 13 have also been similarly amended to recite the phrase, “the polyamine compound contains 3,3'-diethyl-5,5'-dimethyl-4,4'-diaminodiphenylmethane.” Thus, the present invention provides a golf ball exhibiting a “good shot” feel and an excellent controllability compared to that of golf balls having a Balata rubber cover. The presently claimed golf ball cover also provides great durability and flight performance similar to golf balls having an ionomr cover without using a thermoplastic resin or an organic fiber as a cover material. (See, specification, at page 2, lines 13 to 17). As further evidenced by Tables 2 to 4, at pages 22 to 26 of the present specification, the golf ball of the presently claimed invention has superior features and excellent properties.

Further, claims 1, 6 and 13 provide that 3,3'-diethyl-5,5'-dimethyl-4,4'-diaminodiphenylmethane is used as a curing agent of the thermosetting urethane resin composition. (See, specification, at page 7, lines 22-24). This polyamine compound provides a cover having superior durability since the polyamine compound reacts moderately with the isocyanate group-terminated urethane prepolymer.

Although the Examiner states that Herbert et al. disclose a golf ball having a cover comprising a thermoset urethane cover having a thickness of less than about 0.05 inches, or 1.27 mm, and a Shore D hardness of about 30 to 60, Herbert et al. does not disclose a thermosetting urethane resin composition according to the presently claimed invention nor does Herbert et al.

disclose the stiffness modulus according to the presently claimed invention. Thus, the Examiner has failed to establish a *prima facie* case of obviousness because none of the cited references, including the disclosure of Herbert et al., disclose each and every element of the presently claimed invention. (*See, In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991)).

The Examiner further stated that Wu' 358 disclose a golf ball cover made from a thermosetting urethane resin composition which comprises an isocyanate group-terminated prepolymer and a polyamine compound and that the Wu' 358 disclosure recites a golf ball cover having a Young's modulus of about 5000-100000 psi (claim 1) and examples of golf balls having a cover with Shore D hardness of 51 to 58 (Table 1). However, Wu '358 disclose neither use of 3,3'-diethyl-5,5'-dimethyl-4,4'-diaminodiphenylmethane as a curing agent of the thermosetting urethane resin composition, which improves durability of a golf ball, nor the relationship of stiffness modulus and Shore D hardness, which provides the excellent characteristics of a golf ball having a cover according to the presently claimed invention, as previously discussed, above. (*See*, Wu '358, at column 5, lines 39-50 and column 5, line 61 to column 6, line 8).

Additionally, the Examiner states that Wu' 294 discloses a polyurethane composition comprising a reaction product of a prepolymer of at least one polyol and at least one polyisocyanate such as dicyclohexylmethane diisocyanate or isophoron diisocyanate, and a curing agent of at least one diol. (*See*, Wu '294, at columns 3 and 4). However, Wu '294 does not disclose the use of 3,3'-diethyl-5,5'-dimethyl-4,4'-diaminodiphenylmethane as a curing agent of the thermosetting urethane resin composition, which improves durability of a golf ball nor the relationship between the stiffness modulus and Shore D hardness according to the presently claimed invention, which provides the excellent characteristics of a golf ball having a cover

according to the presently claimed invention, as previously discussed, above. (*See*, Wu '294, at column 5, line 66 to column 6, line 9).

Thus, the Examiner has not made a *prima facie* case of obviousness because the cited references do not disclose or suggest, either considering the disclosures individually or in combination, all of the limitations of the presently claimed invention because none of the references disclose or suggest a golf ball cover including a cured product of a thermosetting resin composition containing a thermosetting urethane resin composition comprising: an isocyanate group-terminated urethane prepolymer containing an isocyanate component formed by at least one diisocyanate compound selected from the group consisting of 4,4'-dicyclohexylmethane diisocyanate, cyclohexane diisocyanate and isophorone diisocyanate; and 3,3'-diethyl-5,5'-dimethyl-4,4'-diaminodiphenylmethane. (*See, In re Vaeck*).

Furthermore, none of the cited references disclose or suggest that a golf ball cover made from the claimed constituents having a stiffness modulus of 80 to 260MPa, a Shore D hardness of 40 to 60 and a ratio of stiffness modulus to Shore D hardness of 2.0 to 5.0, as recited in the present claims, and that a golf ball within these parameters would have the unexpected property of "good shot feel" and excellent controllability similar to golf balls having a Balata rubber cover, and durability and flight performance similar to golf balls having an ionomer cover.

No specific reasoning is provided by the Examiner regarding the obviousness rejection of dependent claims 2, 4, 7, 9, 11, 12 and 14-16. Thus, dependent claims 2, 4, 7, 9, 11, 12 and 14-16 are non-obvious, *inter alia*, as depending from non-obvious base claims, claims 1, 6 and 19.

Reconsideration and withdrawal of the obviousness rejection of claims 1, 2, 4, 7, 9, 11, 12 and 14-16 are respectfully requested.

Advisory Action

Furthermore, in the Advisory Action of February 16, 2006, at page 2, the Examiner seems to question whether (a) the claimed subject matter provides effective results and (b) features of the stiffness modulus and Shore D hardness can apply other materials.

With respect to (a), as indicated above, the advantageous properties provided by the golf ball of the present invention are evidenced in Tables 2 to 4 of the present specification. The objectiveness has also been adequately shown by the submitted arguments. Therefore, it is clearly understood that the claimed subject matter significantly affects the properties of the golf ball. With respect to (b), a thermosetting urethane resin composition according to claim 1 comprises a specific isocyanate group-terminated urethane prepolymer and 3,3'-diethyl-5,5'-dimethyl-4,4'-diaminodiphenylmethane. Therefore, the composition of the thermosetting urethane resin to form the cover is also defined over the cited references.

The presently claimed invention being distinguishable over the prior art and there being no further outstanding rejections, timely consideration and allowance of the presently claimed invention is eagerly solicited.

CONCLUSION

If the Examiner has any questions or comments, please contact Thomas J. Siepmann, Ph.D., Registration No 57,374 at the offices of Birch, Stewart, Kolasch & Birch, LLP.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to our Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. § 1.16 or under § 1.17; particularly, extension of time fees.

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Respectfully submitted,

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